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Office Memorandum • UNITED STATES GOVERNMENT

TO : Director, PIC DATE: 3 November 1958
THRU : Chief, Technical Intelligence Services Division
FROM : Chief, Technical Intelligence Branch

SUBJECT: Report on Results of Trip to Pasadena, California 23-27 October 1958

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1. Discussions with resulted in the following plan concerning the interior orientation of CHALICE cameras, past and future.

2. The problem of recovering the interior orientation of the 731 series cameras (i.e., the cameras used in early missions) will be only partially solved. A master cone and master magazine each with the original lens will be used in place of the original cone - magazine - lens combination used during operational flights. Personnel at feel that the difference between master and operational components is within ± .005", and that the lens - setting values are recoverable to ± .0001". Although admittedly this is not the best desirable solution, it is the best that can be done since absolute recovery and assembly of all original components is impossible. The solution for focal length of these cameras should be satisfactory for control extension; however, the lens distortion results will be at least subject to doubt.

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3. The following problems were considered pertinent before it is decided to embark on a program of determining the lens distortion of cameras used in CHALICE program.

Problem I. To determine the reproducibility of lens distortion derived by the stellar method. To determine the solution to this problem, three consecutive exposures will be made using the same lens - cone - magazine - film combination, all processed under identical conditions. The lens distortion will be computed from each of the three exposures. The results will be compared for similarity or reproducibility of pattern. The camera used for these exposures will be A2 configuration used on the Arizona Control Range flights.

Problem II. To determine the reliability of lens distortion derived by the stellar method. Limited control extension will be computed over the Arizona range without and with lens distortion considerations. Control lengths will be computed using space resection solutions derived without lens distortion and the process repeated considering lens distortion. Comparison of true control lengths with computed lengths will indicate the reliability of the method.

To accomplish the solution of the above two problems will require my personal full-time participation for a period of approximately 30 days with the assistance of two men. (Possible source: ACIC, as indicated by Mr. Patrick.)

4. Stellar exposures to test the two problems, were not attempted because of persistent inclement weather. Hycon personnel will, however, make the required exposures. I would have preferred to remain there during the exposure period to assure compliance with overall concepts. However, to remain there any longer was impractical.

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5. The exposures, at Edwards Air Force Base, [illegible] under the direction of Mr. [illegible] are remarkably well done. He has succeeded in using operational film (SO-1153) for star exposures. The resulting exposures are equal or superior to those taken with Royal Pan which has a higher ASA rating. In all, the work there is under excellent control.

There are, nonetheless, complaints that require consideration if this project is to be meaningful; they are: (1) The overall program needs more active direction and support, (2) extended technical control, (3) continuity, (4) system of reporting and handling of data, (5) more personnel, and (6) better training of personnel at field bases.

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